

# Excavations and Survey at Androna, Syria: The Oxford Team 1999

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Androna (modern al-Andarin) lies in the so-called basalt massif located between the better-known Limestone Massif to the west and the Syrian steppe or desert to the east.<sup>1</sup> The area was in the midst of several ancient cities: Epiphaneia (modern Hama) to the southwest, Apamea to the west, Chalcis to the northwest, Anasartha (and the bishopric Gabbula) to the north, and Sergiopolis/Rusafa to the east (Fig. 1). Between Gabbula and Anasartha lies a salt lake exploited in the Byzantine period<sup>2</sup> and today. Pliny states that the region of Chalcis was "a most fertile part of Syria"; it produced cereals, fruit trees, and vines, while the olive appears on its coins.<sup>3</sup> On the basis of their aerial survey in the 1930s, R. Mouterde and A. Poidebard concluded that the steppe of upper Syria was a pastureland surrounded by a belt of cultivated land supported by extensive irrigation works.<sup>4</sup> The date of these works and whether they were state or privately funded are central questions posed for the entire region as well as for Androna, which lies in the zone receiving 250–300 mm of rainfall per annum (see below) and whose water supply system was extensive. This system was, apparently, not maintained much beyond antiquity. Today, in the area of Androna the modern has recently been grafted onto the primitive: beduin still graze flocks on sparse

grass while they irrigate thirsty crops such as cotton and watermelon with water tapped by motorized pumps from drilled wells up to 90 m deep;<sup>5</sup> tents, traditional mudbrick *qubbes*, and modern breeze-block houses stand side by side.

Androna is first attested as a *mansio* on the Palmyra-Chalcis route (leading on to Antioch) in the late third-century Antonine Itinerary,<sup>6</sup> and is described as in ruins by Yaqt writing in A.D. 1225.<sup>7</sup> Although identified as a *home* in an early Byzantine mosaic inscription,<sup>8</sup> Androna was not a typical village and offers interesting points of contrast with villages of the Limestone Massif to the northwest. Lacking city (*polis*) status, Androna nevertheless enjoyed certain urban facilities, being about a mile across with two sets of circuit walls and large extramural reservoirs; its communal buildings included a barracks (*kastron*), a public bath (*loutron*), and a dozen churches. The entire space within the circuit walls is filled with collapsed buildings best seen in aerial photographs (Fig. 2). In 1905 the Princeton University Archaeological Expedition to Syria, under H. C. Butler, planned parts of the site,<sup>9</sup> and in the 1930s Mouterde

<sup>5</sup> See M. Decker on agriculture in Mundell Mango, "Andarin 1998" (see note 16 below).

<sup>6</sup> Mouterde and Poidebard, *Le limes*, 61–63, 174. On the date of the Antonine Itinerary, see *ibid.*, 17 note 3.

<sup>7</sup> Yaqt, *Geographical Lexicon*, 1.373 (1225), cited in G. Le Strange, *Palestine under the Moslems. A Description of Syria and the Holy Land from A.D. 650 to 1500* (1890; repr. Beirut, 1965), 394.

<sup>8</sup> H. Salame-Sarkis, "Syria grammata kai agalmata," *Syria* 61 (1989): 322–25.

<sup>9</sup> PPUAES (Leiden, 1907–49); H. C. Butler, F. A. Norris, and E. R. Stroever, *Geography and Itinerary* (1930), 52–53; H. C. Butler, *Architecture, Section B, Northern Syria* (1920), 47–63; B. W. K. Prentice, *Greek and Latin Inscriptions, Section B, Northern Syria* (1922), nos. 909–45.

<sup>1</sup> On part of this area, see recently C. Foss, "Syria in Transition, A.D. 550–750: An Archaeological Approach," *DOP* 51 (1997): 232–37.

<sup>2</sup> As indicated by an inscription of 553 at er-Rouhweyb in the Gebel il-Hass; R. Mouterde and A. Poidebard, *Le limes de Chalcis. Organisation de la steppe en haute Syrie romaine* (Paris, 1945), 190–91.

<sup>3</sup> Pliny, *Naturalis historia* 5.19.81; Mouterde and Poidebard, *Le limes*, 13 and note 2.

<sup>4</sup> Mouterde and Poidebard, *Le limes*, 234f., 238f.

and Poidebard included it in their aerial survey of "the limes of Chalcis."<sup>10</sup> Butler identified two phases of building: a Roman phase (2d century?) represented by a hypostyle structure (the "*praetorium*"), inner circuit walls, and the reservoir southeast of the site, and an early Byzantine phase represented by the other public buildings and attested by numerous Greek inscriptions (eight precisely dated between A.D. 507 and 583/4),<sup>11</sup> including those of the *kastron* built in A.D. 558–559 by the same individual (Thomas) who built the bath opposite.<sup>12</sup> The *kastron* has been linked with a network of sites that were fortified in the second half of the sixth century, considered by Mouterde and Poidebard as an inner bulwark against the Persians between the Euphrates and Antioch.<sup>13</sup> "Farmers" may be mentioned in the bath inscription,<sup>14</sup> and an early Arabic text, 'Amr Ibn Kulthum's *Mu'allqa*, states that Androna was noted for superior wine production.<sup>15</sup> Trade probably passed through the site, as it was a *mansio* on a main road.

The current international project,<sup>16</sup> started in 1997 by three collaborating teams from the Syrian Department of Antiquities (under Dr. A. Zaqzuq, director of the Hama Museum) and the universities of Heidelberg (under Prof. C. Strube) and Oxford (under Dr. M. Mango),<sup>17</sup> aims to elucidate the diachronic development (from Roman to Islamic) of Androna's resources, defenses, size, and spatial organization. This is being done by means of survey, excavation, and study of the water supply, circuit

walls, and public and domestic buildings. Heidelberg's topographical survey of the site in 1997 revealed evidence of an orthogonal plan and two variant systems of building alignment that could have phasing implications (Roman and Byzantine). This problem may be clarified by excavation of central structures, namely the bath and the *kastron*, being carried out by Oxford and Heidelberg, respectively, as well as parts of the main street (Fig. 2). Heidelberg's geophysical survey and soundings of the circuit walls, planned for 2000, may help to prove site expansion from the Roman to the Byzantine period rather than the reverse, a hypothesis to be further confirmed by excavation of domestic complexes next to and between these walls. Excavation to date has revealed some traces of Islamic period activity at Androna (e.g., an oven [?] in the bath; pottery and inscriptions in the *kastron*). Oxford's work on buildings, such as the bath (Fig. 5), and installations linked to the water supply (Figs. 20, 21) as well as agriculture, will help to assess the technological and financial resources available to a desert site in the Byzantine period. Survey and soundings of the reservoirs and *foggaras* (subterranean inclined galleries that tap aquifers, leading water to the surface) will clarify the dating and nature of the settlement at Androna, and in particular answer the question whether the large investment in the irrigation system was pre-Roman, Roman, or Byzantine, public or private. Work on the bath and water supply continued in 1999.<sup>18</sup>

<sup>10</sup> Mouterde and Poidebard, *Le limes*, 15, 171–74, 217, pls. CX–CXIII.

<sup>11</sup> *IGLSyr* 4 (1955), nos. 1676–1713.

<sup>12</sup> *Ibid.*, no. 1682.

<sup>13</sup> Mouterde and Poidebard, *Le limes*, 229–40.

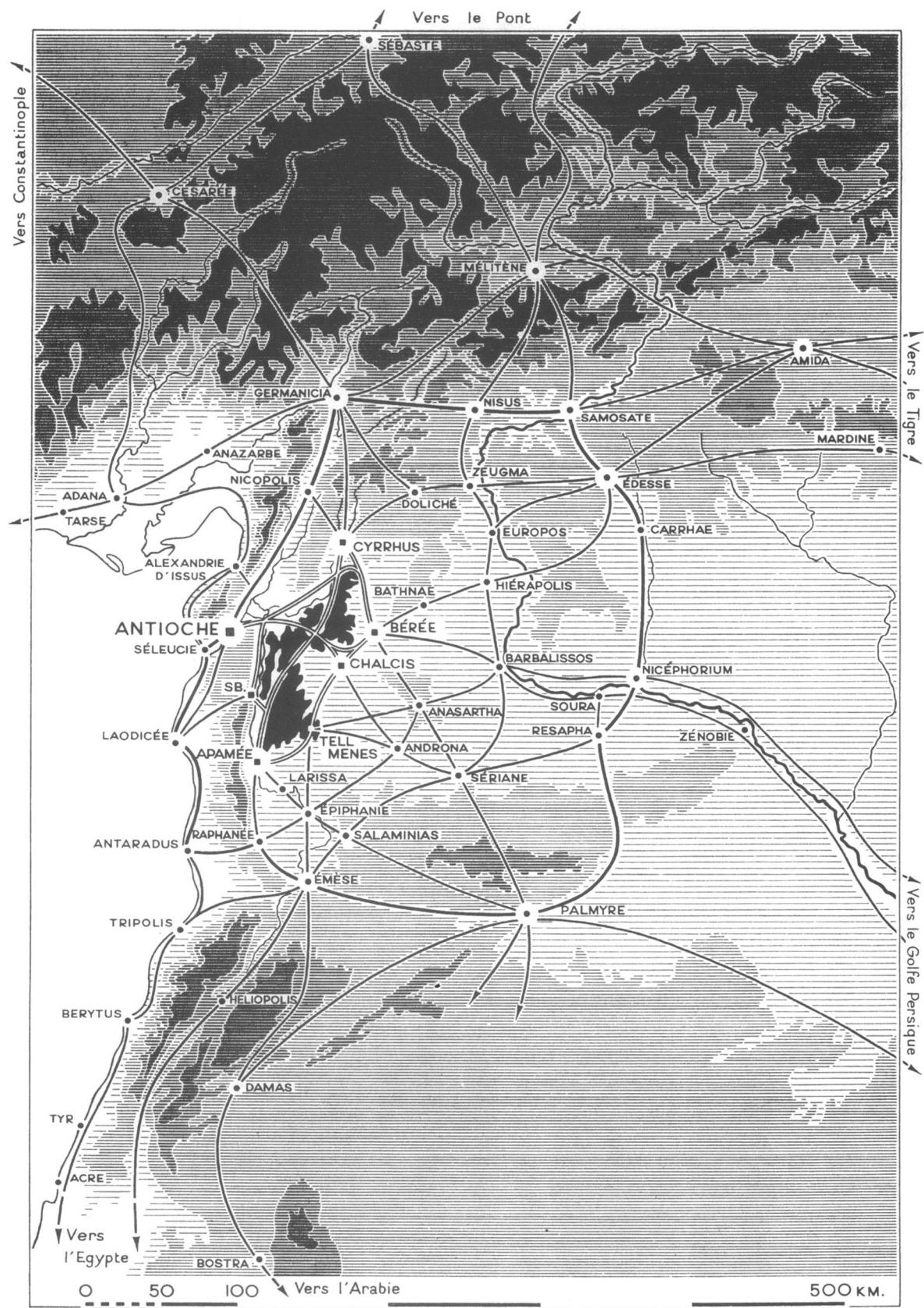
<sup>14</sup> C. Mango on inscriptions in Mundell Mango, "Andarin 1998" (see note 16 below).

<sup>15</sup> Mouterde and Poidebard, *Le limes*, 15 note 1; E. Honigmann, "Syria," *RE* 1562.5.

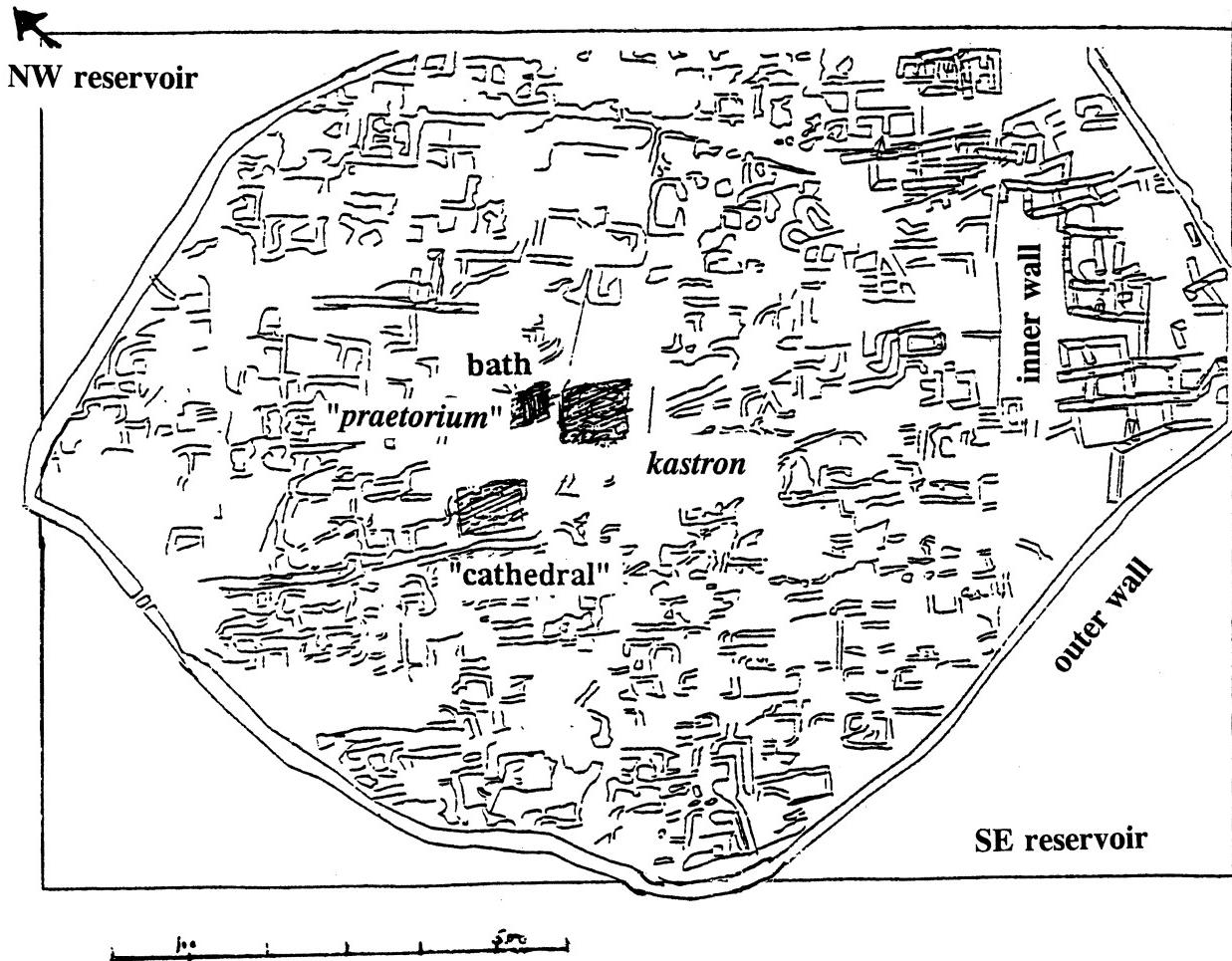
<sup>16</sup> C. Strube and M. Mundell Mango, "Excavations at Andarin/Androna," in *La Syrie moyenne de la mer à la steppe* (Damascus, in press); M. Mundell Mango, "Oxford Excavations at Andarin (Androna): September 1998," with contributions by M. Decker, C. Mango, N. Pollard, C. Salter, and A. Wilson, *AArchSyr* (in press); M. Mundell Mango, "Oxford Excavations at Andarin (Androna), September 1999," *AArchSyr* (in press).

<sup>17</sup> Oxford's participation was made possible by funding from the University of Oxford, principally a generous grant made by the Research and Equipment Committee specifically for the first season of work in 1998; this was supplemented by an award from the Craven Committee and grants from St. John's College and the Modern History Faculty.

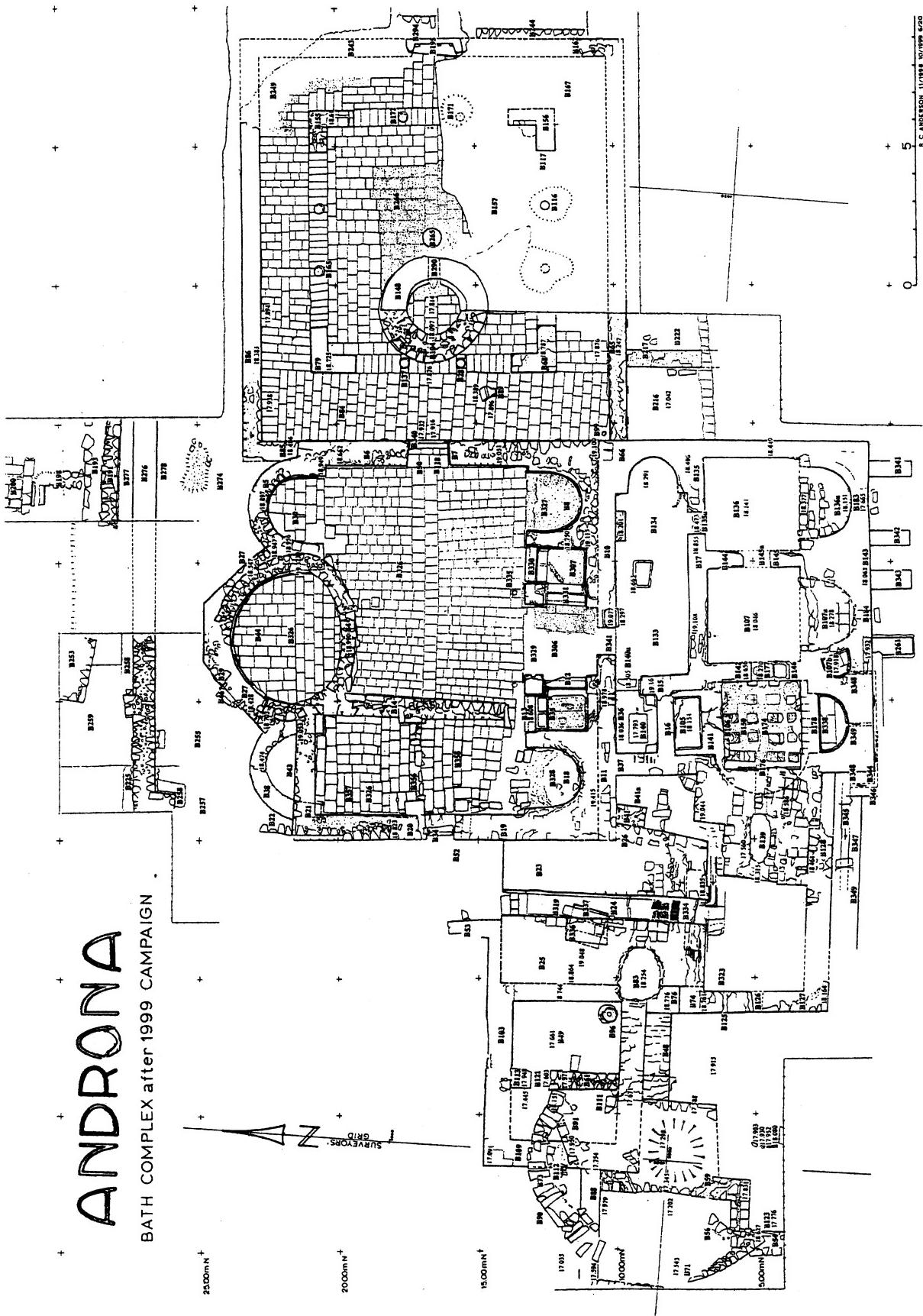
<sup>18</sup> Members of the Oxford team in 1999 were: Dr. Marlia Mango, director; Tyler Bell, Amanda Claridge, Michael Decker, Cassian Hall, Prof. Cyril Mango, Dr. Nigel Pollard and Dr. Andrew Wilson, archaeologists; Richard Anderson (also kite photographer) and Tassos Papacostas, architects; David Hopkins, draftsman; and Dr. Robert Hoyland, translator and general organizer in Syria. We were joined by two Syrian archaeologists, Fatima Mahmud and Afamiya al-Qasab. Our local workmen and women numbered twenty-two. Excavation took place during the month of September. The season's work was made possible by generous grants from Dumbarton Oaks, the Council for British Research in the Levant, and the Craven Committee of Oxford University. For support in securing these grants, we are grateful to Prof. Clive Foss, Prof. R. R. R. Smith, Prof. Jean-Pierre Sodini, and Dr. Bryan Ward-Perkins. I should like to thank Bob Wilkins and Ian Cartwright of the Institute of Archaeology, Oxford, for making the photographic prints for this and other articles. Excavation in 1999, as in 1998, was carried out according to a strategy devised by Amanda Claridge. The following report on the excavation of the bath building is based on the notes written by the respective trench supervisors identified below and on personal observation.



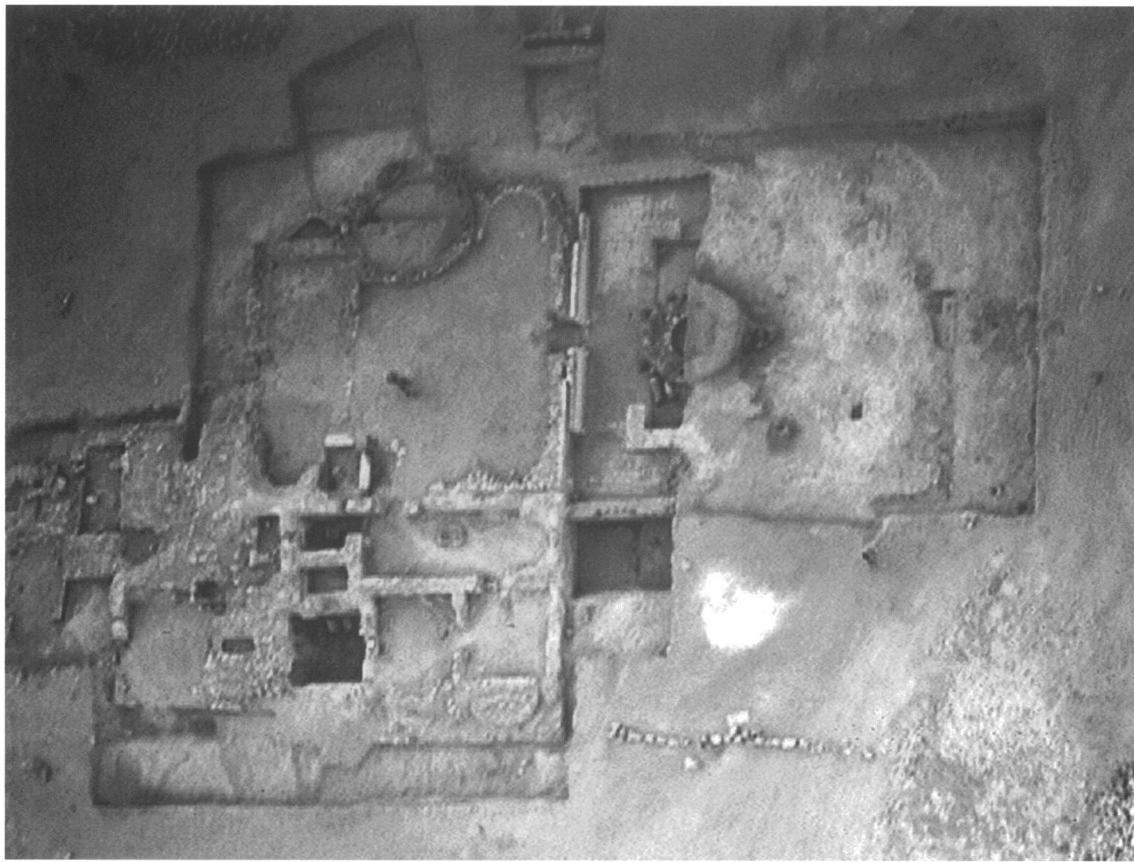
1 Map of Syria. The limestone massif is indicated in black  
 (after G. Tchalenko, *Villages antiques de la Syrie du Nord. Le Massif du Bélus à l'époque romaine*, vol. 2 [Paris, 1953], pl. xxxix)



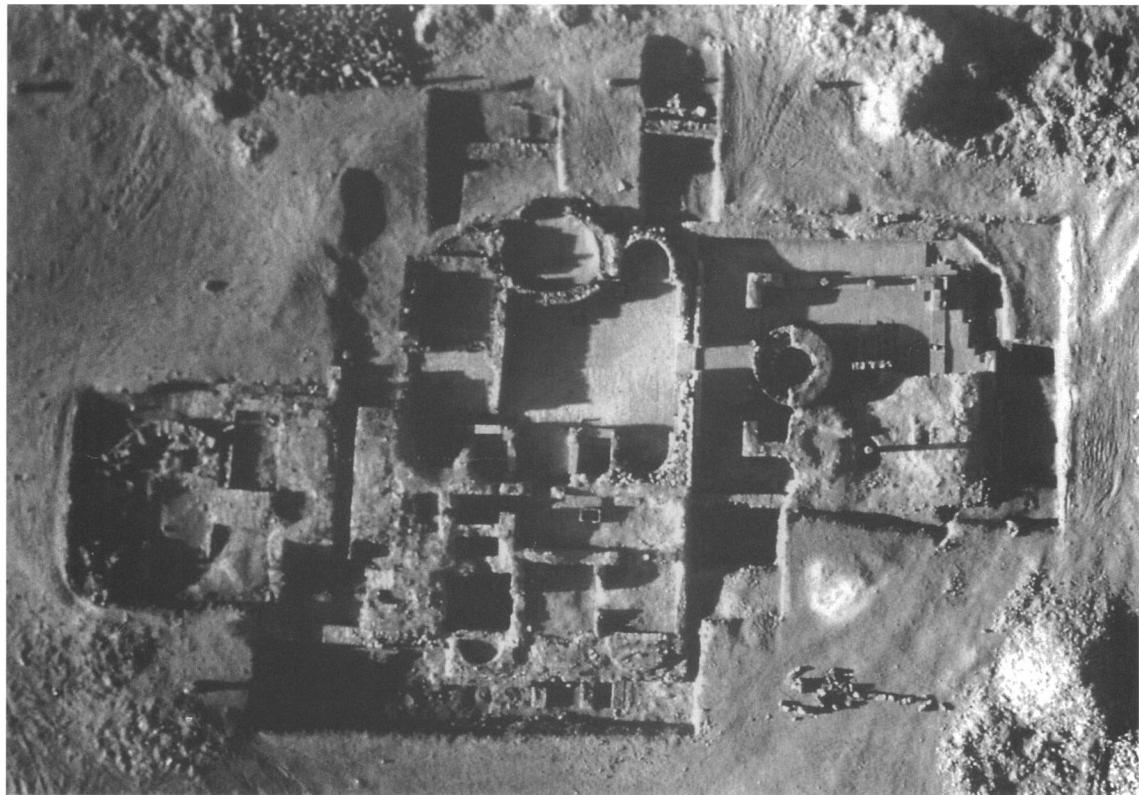
2 Computerized plan of Androna (after A. Wickham, 1977, from an aerial photograph in R. Mouterde and A. Poidebard, *Le limes de Chalcis. Organisation de la steppe en Haute Syrie romaine* [Paris, 1945], pl. cxii)



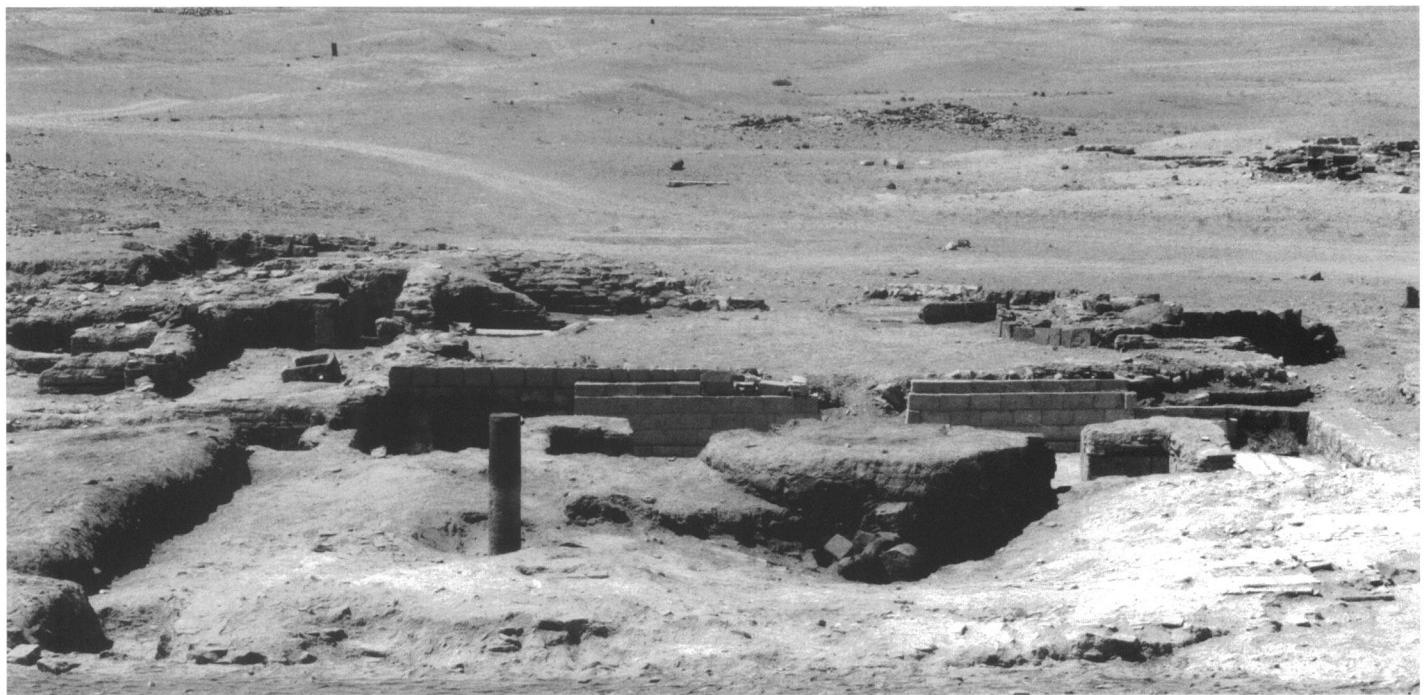
3 Plan of bath, as excavated in 1999, Androna (drawing: R. C. Anderson)



4 Bath, showing east court excavated to presumed Umayyad level, north at top, mid-season 1999, Androna  
(photo: R. C. Anderson)



5 Bath, north at top, end of 1999 season, Androna (photo: R. C. Anderson)



6 Bath, east entrance court, general view, looking west toward an Umayyad "kiln" (center) and surrounded by a layer of trampled masonry, Androna



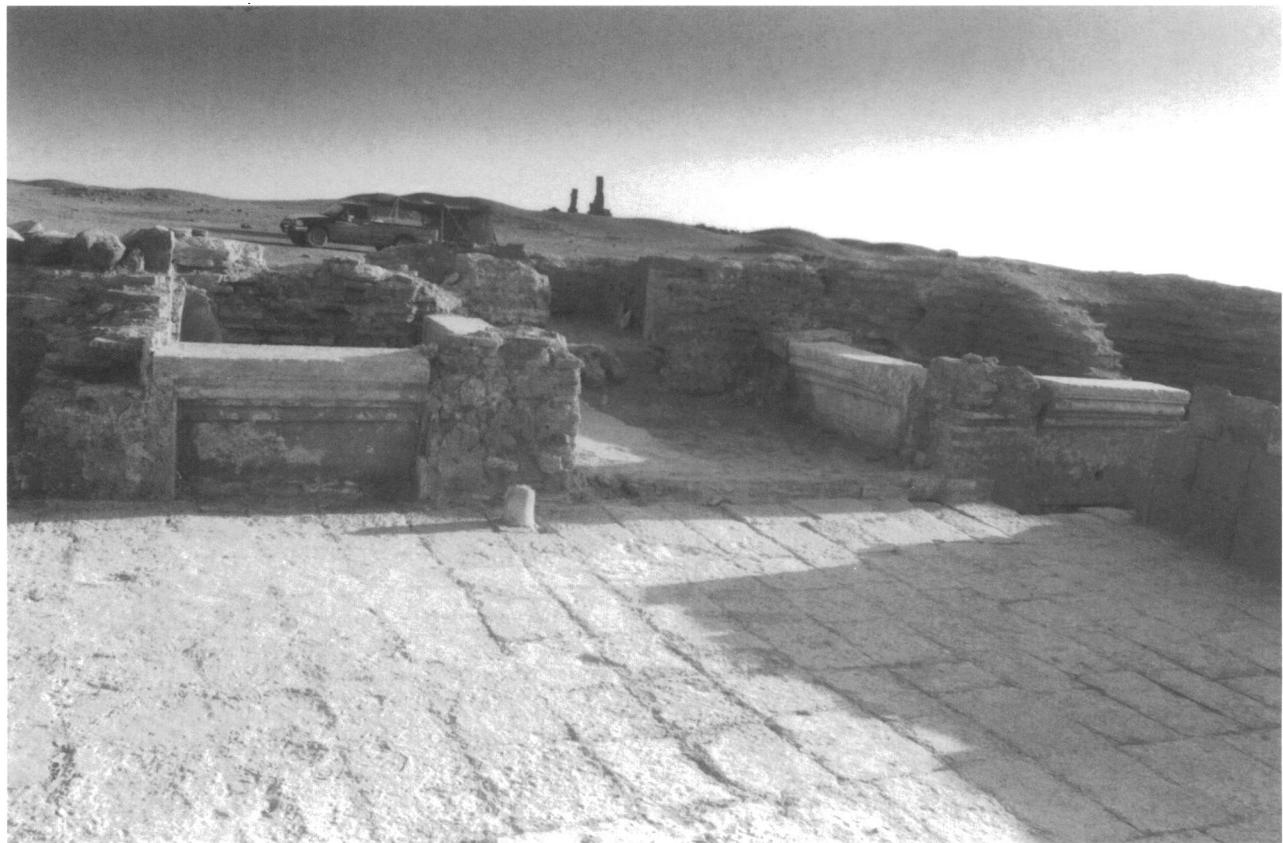
7 Bath, east entrance court, looking southeast, Androna. Note the rerected columns of peristyle and an Umayyad "kiln" (center).



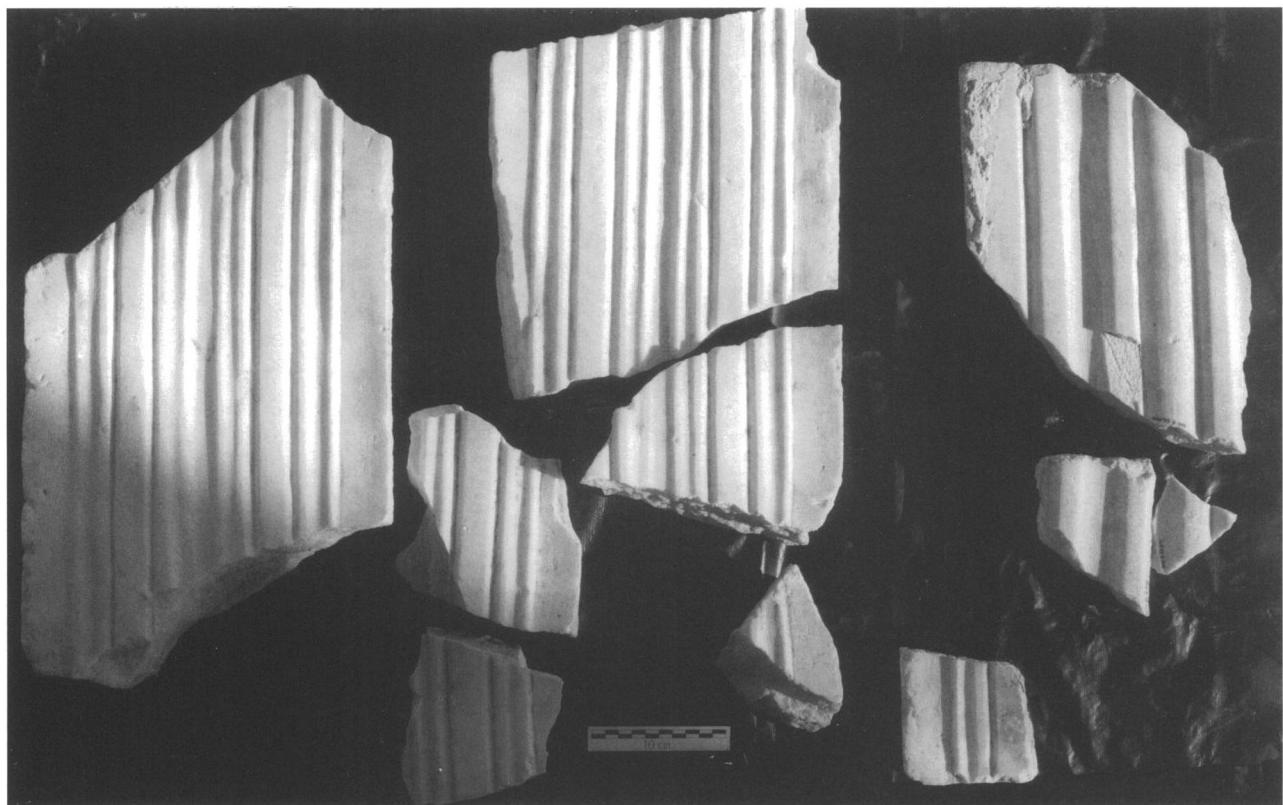
8 Bath, *frigidarium* looking north to 20th-century *qubba* complex, Androna



9 Bath, *frigidarium*, looking southeast, Androna. Note the *qubba* installed over central north apse of bath, fill of collapsed mudbrick upper walls being cleared.

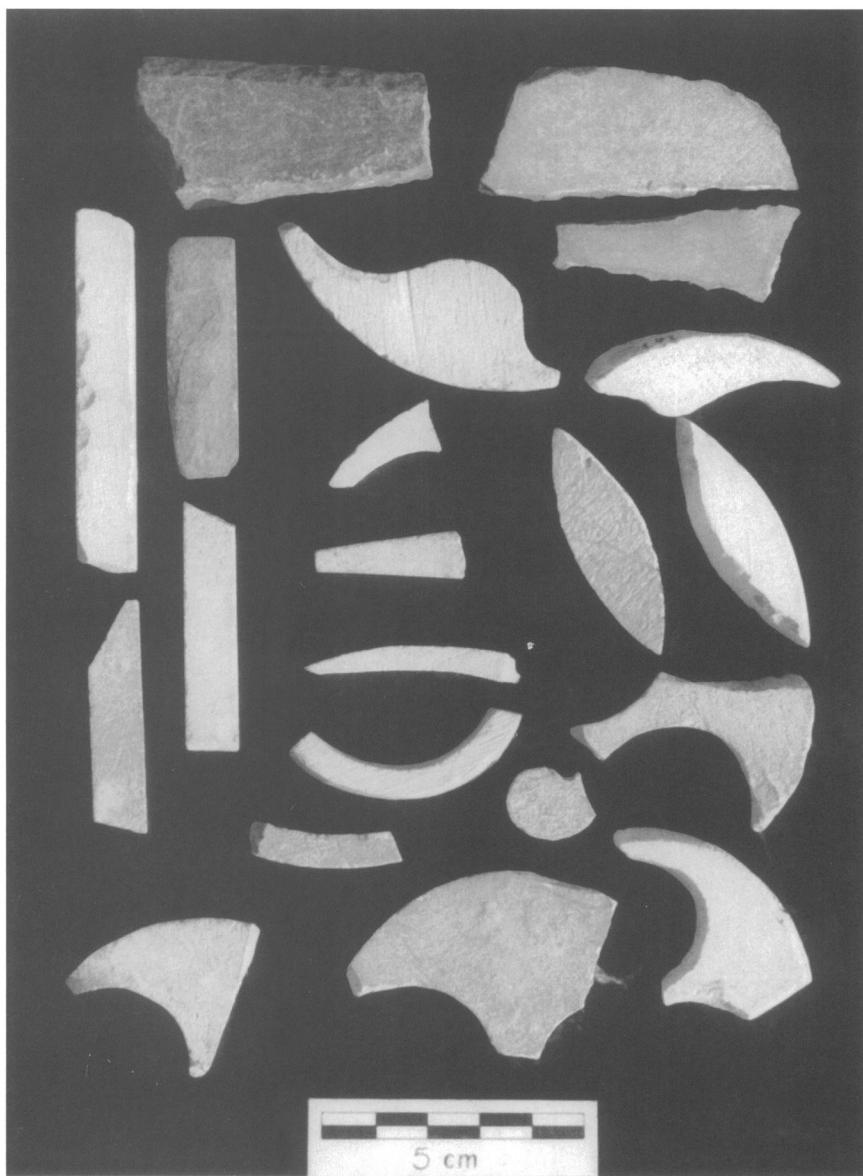


10 Bath, *frigidarium*, overview, looking southwest toward two pools flanking south door, Androna



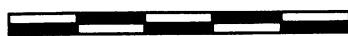
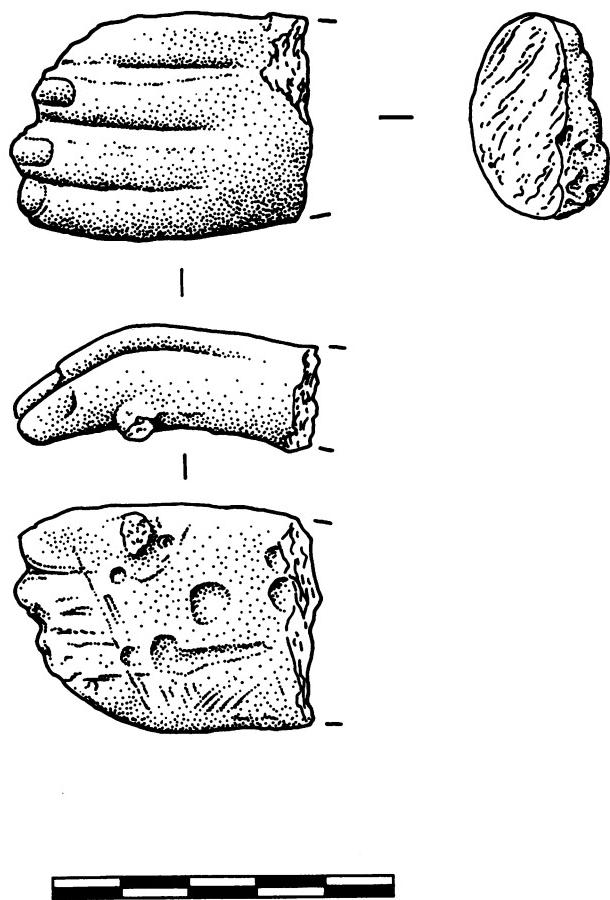
11 Bath, fragments (from *frigidarium*) of marble door moldings, Androna

12 Bath, fragment (probably from *frigidarium*)  
of marble-fluted basin in west well, Androna



13 Bath, *frigidarium*, limestone  
and slate pieces of *opus sectile*  
from mural panel found near  
east entrance, Androna

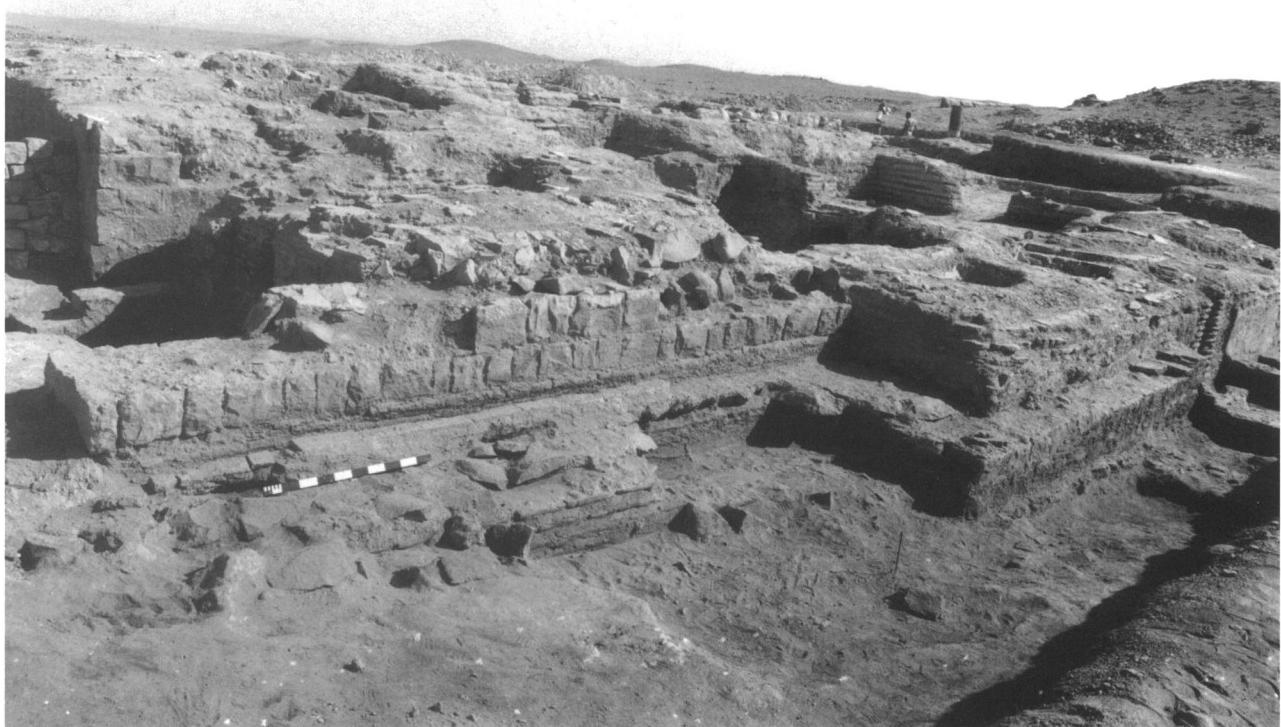
14 Bath, *frigidarium*, part of hand  
from small marble statue, Androna



15 Bath, southwest *caldarium*, hypocaust, looking west, Androna



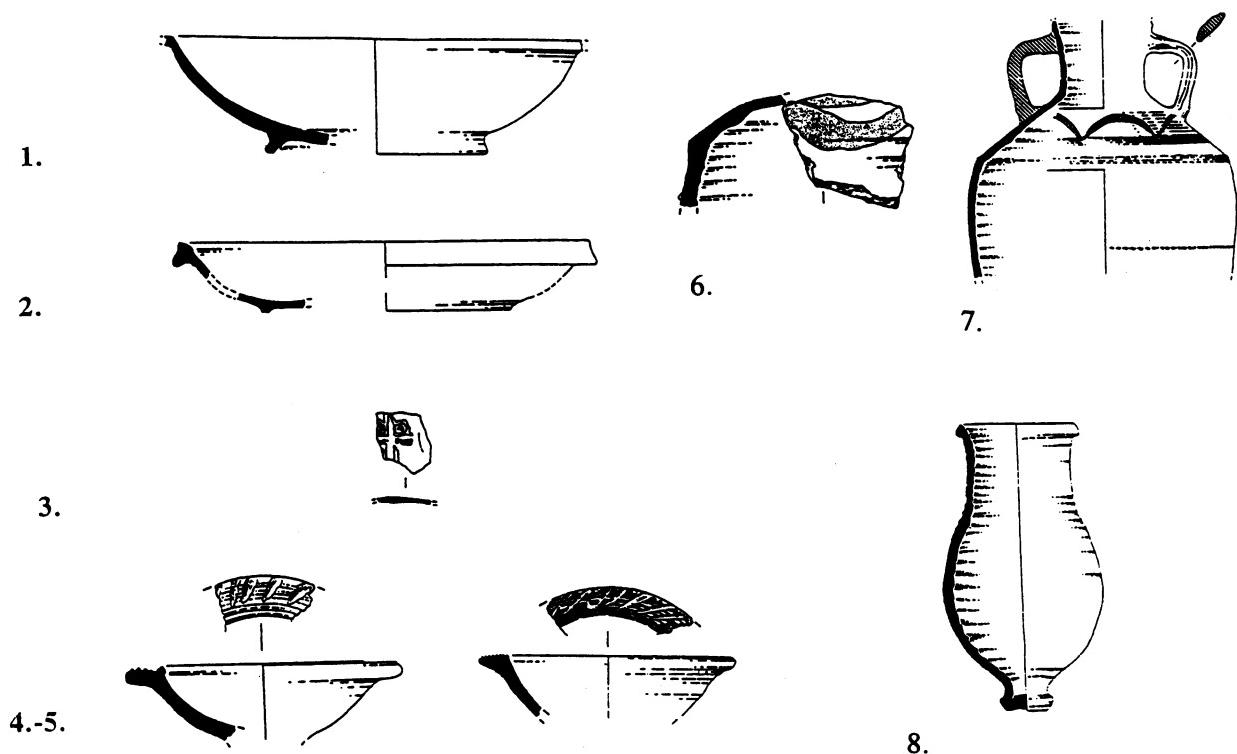
16 Bath, *caldaria*, semicircular pools on south, looking east, Androna



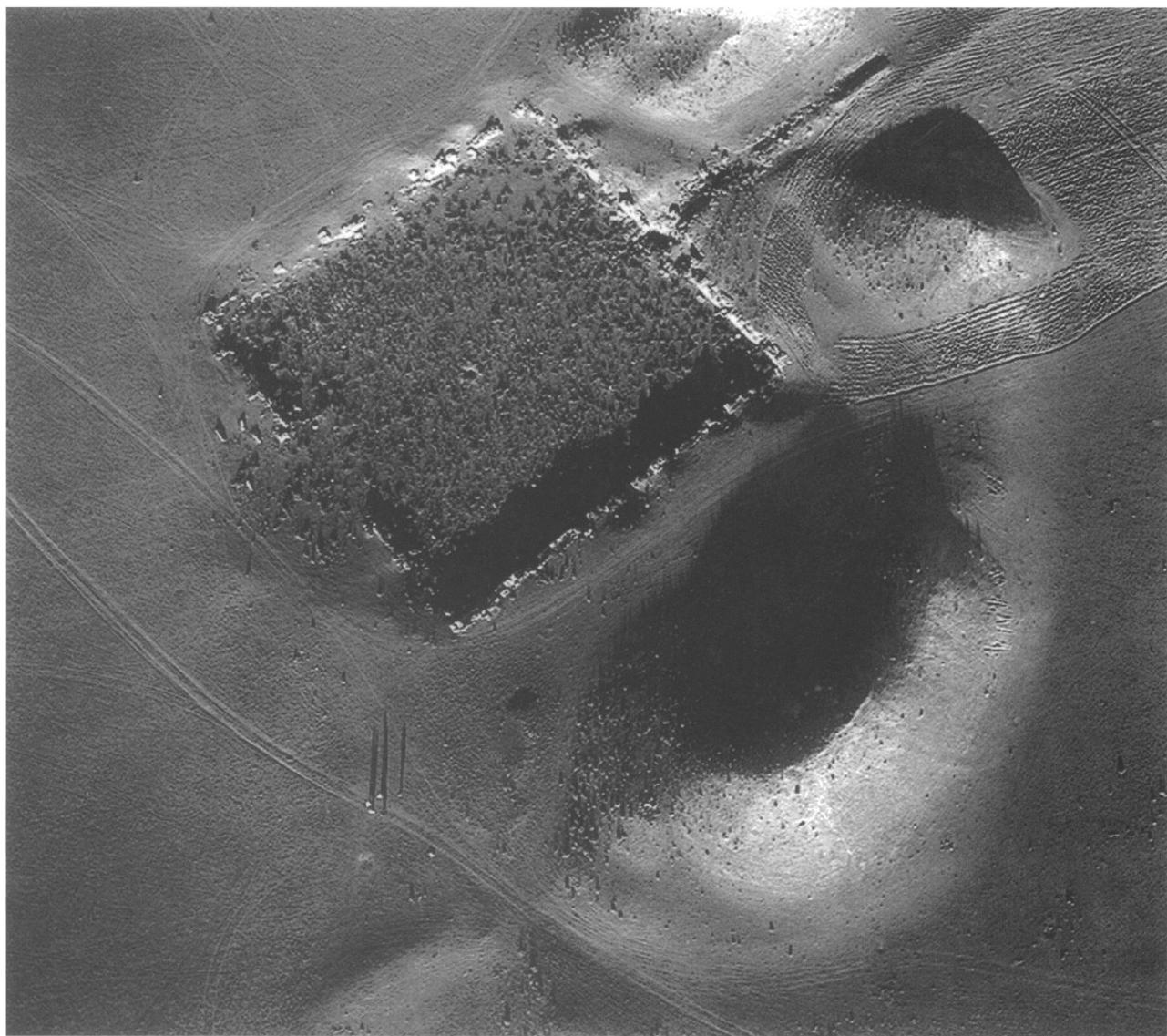
17 (below) Bath, *caldaria*, looking northeast to raised drainage channels along exterior walls, Androna



18 Bath, west service area, passage B24 (possibly the wheel house), looking west toward well under arch, Androna



19 Bath, pottery: (1–3) finewares; (4–5) coarseware bowls; (6–7) amphorae; (8) *saqiya* jar; Androna



20 Southeast reservoir, Androna (photo: R. C. Anderson)



21 Northwest reservoir, Androna (photo: R. C. Anderson)

### THE BATH

In addition to the important question of its water supply in this desert site and its close links (date, common donor) with the barracks opposite being excavated by Heidelberg,<sup>19</sup> Oxford chose to excavate the bath for several other reasons: the relative rarity of bath architecture in late antiquity compared with that of churches; the interest of a bath in a non-*polis* setting; and the possibility at Androna of an architectural form more complex than that of baths in the Limestone Massif. Furthermore, the bath presented the opportunity to assess the level of technology employed and the quality of the building's construction and decoration, as reflecting the resources available to an apparently untitled individual (Thomas) at a rural site during this period. Both the bath and *kastron*, built in ca. 558 by private initiative, provide contrary evidence to the theory that the plague of 542 precipitated a general decline in the empire.<sup>20</sup>

The bath built by Thomas at Androna in ca. 558 was identified by Butler, thanks to an inscription carved on a loose lintel that calls the building a *loutron*.<sup>21</sup> Butler produced a plan of the bath whose features were found to correspond only generally to the building we are now uncovering (Figs. 4, 5).<sup>22</sup> During the 1998 season we laid out a grid 45 × 25 m over the area indicated by Butler. Excavation was carried out horizontally in order to establish the overall extent of the building, and on average it was limited to a depth of 0.50 m with the removal of topsoil. The basalt and brick bath building was divided into four parts (Fig. 3): (1) an entrance court on the east; (2) a *frigidarium* on the north; (3) a *tepidarium* and *caldaria* on the south; and (4) a service area on the west.<sup>23</sup> Notable finds from the bath made in 1998 included part of a second inscribed lintel referring to the *loutron*,<sup>24</sup> figural wall paintings in the

entrance court,<sup>25</sup> a water-lifting (*saqiya*) jar (on which see below), standing upright in a corner of the court, containing four Byzantine coins of the sixth–seventh century (Fig. 19.8),<sup>26</sup> and a quantity of marble and other decorative stonework, some being champlevé carved fragments.<sup>27</sup> We continued to excavate in the four main areas of the bath in 1999.

*The East Entrance Court (supervised by A. Claridge; in final stages by C. Mango and A. Al-Qasab)*

On the east side we uncovered much of the stone-paved court which had a peristyle plan formed by L-shaped piers and pairs of columns surmounted by capitals decorated with simple leaves (Fig. 3). In 1999 excavation advanced to the east as far as the doorway onto the street and revealed evidence of two periods: that of the bath's construction in ca. 558 and that of its (partial?) destruction—perhaps up to a hundred years later—which was apparently contemporary with the court's reuse for industrial activity. Destruction layers were encountered under the topsoil. First was a layer (20–30 cm high) of lightly compacted mudbrick that overlay a thick ashy deposit. The mudbrick and ashy deposit were removed to reveal a crusty surface (B157) formed over the fallen masonry of the collapsed peristyle superstructure of the court (Figs. 4, 6). The building debris had been trampled from the height of the top of the L-shaped piers on the east side of the court (B155, B156), which had apparently been reduced to a uniform low level, downward toward the center of the court to the base of a later circular structure (B104/B148) built soon after the destruction of the court (Fig. 7).

This later structure (B104/B148), the west half of which had been uncovered in 1998 by N. Pollard, had been built directly onto the court floor (B84), its walls (ca. 1.00 m thick) composed of two bottom courses of tapering basalt blocks (including one 6th-century capital from the peristyle) topped by mudbrick. A

<sup>19</sup> Strube and Mundell Mango, "Andarin/Androna," fig. 6.

<sup>20</sup> See, e.g., H. Kennedy, "From *polis* to *madina*," *Past and Present* 106 (1985): 3–27.

<sup>21</sup> See C. Mango on inscriptions in Mundell Mango, "Andarin 1998."

<sup>22</sup> Butler, *Architecture*, B, II, ill. 61; Mundell Mango, "Andarin 1998," fig. 2.

<sup>23</sup> Mundell Mango, "Andarin 1998," figs. 3–4, 9–11.

<sup>24</sup> Excavated by the Heidelberg team in 1998 to the west of the *kastron*. See C. Mango on inscriptions and figs. 17–18 in Mundell Mango, "Andarin 1998."

<sup>25</sup> Excavated by N. Pollard. Mundell Mango on the frescoes and figs. 11, 22–23 in "Andarin 1998."

<sup>26</sup> These were two 40-nummi and two 20-nummi pieces, with the equivalent value of the entrance fee to the bath for six persons, 120 nummi. See C. Mango on coins and fig. 27.4 in Mundell Mango, "Andarin 1998."

<sup>27</sup> See Mundell Mango, "Andarin 1998," figs. 19–21.

stoke hole with tiled pointed top (B290) in the center of the east side opened into the interior whose vertical walls have a plaster or burned mudbrick lining. The structure, possibly a kiln, contained ten levels of deposits, the lower two of which were sampled for flotation and have yielded various grains now being studied at Oxford.<sup>28</sup> Identification of other recovered material should clarify the function of the structure.

The broad layer of trampled masonry was cleared from the north side of the court down to pavement level (Figs. 5, 7). From under the later accumulations of mudbrick, ash, and compacted fallen masonry emerged original features of the court structure (Fig. 3). These included the two east piers (B155, B156) mentioned above; the sites of the columns (B171, B172), now lost, between them (Fig. 4); and two other, fallen columns, collapsed arches, and a series of iron nails from the north peristyle superstructure. Two further columns of the peristyle had been left standing at the time of destruction. Likewise exposed was a circular cistern head (B265) situated in the center of the court directly opposite the stoke hole of the “kiln”; samples were taken of the silty earth filling the cement-lined shaft down to 0.90 m from the opening surface. The southeast corner (B162) of the building was also uncovered, as was the threshold (B195) of the entrance to the bath building from the street, situated in the center of the east edge of the court, fronted by a curb (B294). Stones from near this entrance were found to have been robbed, as was the paving (B266) around the central wellhead and at the northeast corner of the court (B249).

Coin evidence recovered in the court pertains to both its period of construction and at least partial destruction. In 1999 a sixth-century 20-nummi piece, presumably dropped during the period of construction (which is placed ca. 558 by the inscribed lintel; see note 21), was found under the threshold (B195) of the street entrance to the bath. The four 20- and 40-nummi pieces (of the 6th–7th centuries) found in 1998, mentioned above, were inside a jar (Fig. 19.8) sealed in a corner of the court under the rubble of the collapsed west

aisle of the peristyle. They therefore provide a *terminus post quem* for the destruction of at least that part of the court, possibly in the later seventh or early eighth century.

At the end of the season we reerected two newly uncovered fallen columns in the north side of the peristyle and two parts of a column broken by vandals after our 1998 season, which were set into the two western sockets (Fig. 7).

*The North Frigidarium (supervised by C. Hall, C. Mango, A. Al-Qasab, and M. Mango)*

The *frigidarium* has a roughly symmetrical layout with five apses (Fig. 3). Only the upper part was excavated in 1998, and in 1999 we continued down to floor level. This section of the bath had been partly built over by a circular beehive-shaped *qubba* (B3) (a local type of structure). Its postulated dating to the twentieth century was confirmed in 1999 by the discovery of modern material while emptying the mudbrick collapse of the upper wall filling the *qubbe* (Fig. 9). Embedded in the clay bonding with its lower stone wall was a glass bottle with “50” written on its base in raised letters and a length of barbed wire; a piece of nylon stocking was also found in the fill. Within the layers of compressed organic matter composing the lowest level covering the stone pavement droppings observed indicate that the *qubba* had been used to house animals. An attached rectangular room (B357) and open yard (B358), both enclosed by a combination of mudbrick, new stone walls (B14, B21, B356), and original bath construction (B19, B20), were contemporary with and attached to the *qubba* (Fig. 8). For the time being, the stone walls of this late complex were left in place. Likewise of modern construction was a low curved wall of uneven stone masonry extending from the southeast apse (B8) to the main doorway (B50) on the east side of the *frigidarium*. Within this enclosure was found a piece of plastic mixed in with older material from the bath. Like the *qubbe* complex, this wall was sited directly on the bath pavement (B326).

Excavating the rest of the *frigidarium* (starting with an exploratory section at the east doorway and three others dug to a depth of ca. 0.20 m), we encountered mostly building rubble from the superstructure including brick, mortar, and stone, as well as decorative materials such as marble, which had accumulated on the pave-

<sup>28</sup> By Dr. Mark Robinson. As noted in the 1998 report, the diameter of the supposed oven is close to that of Umayyad pottery kilns built on the Byzantine agora of Scythopolis; G. Mazor and R. Bar-Nathan, “The Bet She‘an Excavation Project 1992–1994,” *Excavations and Surveys in Israel* 17 (1998): 18–20, fig. 16.

ment as the building collapsed, perhaps gradually. The following successive deposits were noted in front of the east doorway: (1) directly on the pavement was a layer of fragmentary thin sheets of gypsum (from a window above the door?), over which lay (2) a piece of molded marble revetment (from the door frame?) and brick fragments; followed by (3) a layer of clay (5 cm high), above which was (4) debris to a height of 15 cm and on the top (5) a layer of numerous *opus sectile* pieces, apparently from a panel once attached to the wall above the door (see below). No sign of a general conflagration was observed. Other possible causes of destruction (earthquake, progressive decay following abandonment) will be discussed in a future publication, when the particular historical circumstances in this, the region of Chalcis at the time of the Arab conquest, must be taken into consideration.

The original architectural features of the *frigidarium* (Fig. 10) included doorways in the east (B50), south (B341), and west (B34) walls, that on the east preserving an iron door pivot (B340) *in situ* in its sill; large fragments of marble revetment moldings, found near this and the south door, may have decorated their inner faces (Fig. 11). Two pools (B35, B307) were exposed, flanking the south door. These are formed by pairs of large marble blocks (B12, B13, B330, B331) joined by a pier and built against the south wall (B11, B10) of the hall and the projecting lateral walls (B9, B11) of the south apses. Each block has moldings on its outer face and a bench on its interior. Vestiges of marble revetment remain on the piers and back walls of the pools, which have a cement floor and a drain hole on their north side. Stone posts had been set upright in the pavement in front of the pools, part of one being found *in situ*.

The pavement of basalt slabs (B326) revealed in the *frigidarium* (Fig. 10) is the same as that in the entrance court (Fig. 7) and resembles that in the nearby palace at Qasr ibn Wardan of contemporary date (564). At Andarin, the pavement is laid out differently in the entrance court and in the *frigidarium*, where oblong stones are aligned north-south except across the middle area where broader stones forming a contrasting east-west pattern connect the two opposite doors. The two south apses (B138, B18) had a different type of floor of *opus sectile* paving (B327, B328), of which a setting bed re-

mains and some octagonal slabs of Proconnesian marble were recovered.<sup>29</sup>

As in 1998, a large amount of Proconnesian and other marble was excavated in the *frigidarium*, which had been richly decorated. As well as the *opus sectile* paving and the doorway moldings (Fig. 11) mentioned above, this included many other pieces of wall revetment, surrounds, and champlevé carving<sup>30</sup> of the type known at Antioch, Qal'at Sim'an, in Cyprus, and in Lebanon.<sup>31</sup> The fragmentary mural panel of *opus sectile*, found fallen just inside the east door, was composed of pieces cut from limestone, slate, and other stone (Fig. 13); contemporary *comparanda* are found at Apamea and Pella.<sup>32</sup> Offcuts from marble moldings, of various colors and already polished, used as packing for the uneven surfaces of the basalt walls, were found still adhering to the wall (B7) by the east doorway and fallen into a heap in the northeast apse. The vertical wall surface thus corrected was then revetted with sheets of marble. A large slab of plaster, embedded with an iron clamp for securing a marble slab, was found loose by the southwest pool. Lumps of plaster still set with glass mosaic tesserae and pieces of gypsum probably used as windowpanes (see above) were retrieved from the *frigidarium*; window glass has also been recovered from various parts of the bath. A fragmentary marble fluted basin (Fig. 12) excavated in 1999 nearby in the western service area (B337) may have originally sat atop one of two posts that once stood beside the *frigidarium* pools (Fig. 10). Part of a hand from a small marble statue (Fig. 14), possibly of the type still produced in the fourth and fifth centuries for display in houses and baths,<sup>33</sup> was found by the southwest pool.

<sup>29</sup> Mundell Mango, "Andarin 1998," fig. 19.

<sup>30</sup> Mundell Mango, "Andarin 1998," fig. 20; Strube and Mundell Mango, "Andarin/Androna," fig. 6.

<sup>31</sup> Mundell Mango on marble and other stones, "Andarin 1998." See K. Weitzmann in R. Stillwell, ed., *Antioch-on-the-Orontes, III, the Excavations 1937–1939* (Princeton, N.J., 1941), 135 ff.; S. Boyd, "Champlevé Production in Early Byzantine Cyprus," in N. P. Ševčenko and C. Moss, eds., *Medieval Cyprus. Studies in Architecture and History in Memory of Doula Mouriki* (Princeton, N.J., 1999), 49–51.

<sup>32</sup> Mundell Mango on marble and other stones, "Andarin 1998," fig. 21; on Pella, see R. H. Smith and L. P. Day, *Pella of the Decapolis. 2. Final Report of the College of Wooster Excavations in Area IX, The Civic Complex, 1979–1985* (Sydney, 1989), 43–44, pl. 24; on Apamea, J. C. Balty, *Guide d'Apamée* (Brussels, 1981), 120, figs. 133–34.

<sup>33</sup> E.g., in *Byzantium, Treasures of Byzantine Art and Culture*, ed. D. Buckton (London, 1994), no. 25.

*The South Tepidarium and Caldaria (supervised by M. Mango, C. Mango, and A. Al-Qasab)*

The south section of the bath (Figs. 3, 6), partially excavated in 1998 (the west hypocaust and two pools in the northwest corner), was built entirely in brick as a complex of further apsed rooms (a *tepidarium* on the north [B133, B134] and three *caldaria* on the south [B106, B107, B136]). These incorporate a series of marble-lined or plastered pools (B140, B105, B107b, B338) or substructures thereof (B107a, B136a), hypocausts (B150), and furnaces (B139, B261, B341–B343), and yielding pipes,<sup>34</sup> flues, and other apparatus. In 1999 we enlarged the area of excavation to the south, starting with room B106. Clearing the topsoil to establish the extent of the room, we found that its floor and parts of its upper walls had collapsed into the hypocaust (B150) below. This lower space contained a compacted mix of broken brick, mortar, fragments of *pilae* (small pillars), floor bedding, and other rubble from both rooms, to a depth of 1.14 m. Under this debris, the layer of ash (0.12 m deep; B173) accumulated on the floor (B174) was sampled for flotation and cleared.

Engaged *pilae* once supporting the hypocaust floor (B179, B181, B182) still stand at heights up to 71 cm against three walls of the hypocaust, and those on the west (B180) reach approximately 1.4 m (Fig. 15), while only the impressions of square *pilae* (B175) remained on the center of the concrete floor (B 174). Judging by their preserved heights and the distance between the floors of B106 and B150, the *pilae* were originally relatively tall. Five heating shafts (B178) led from the hypocaust under the semicircular pool (2.2 × 1.1 m; B338) on the south side of room B106, which was revetted and paved in marble (2.2–4.5 mm thick) covered in lime scale (Fig. 21). We left unexcavated the arched opening (B176) leading into the hypocaust from the furnace on the west (B139), rooms B107 and B136 and their hypocausts to the east, and the *tepidarium* (B133/134) to the north.

Among the rubble in the excavated hypocaust, the debris from room B106 included remnants of a white limestone tessellated pave-

ment<sup>35</sup> and numerous pieces of plaster, some preserving traces of up to three layers painted in different colors, ranging from pale blue/gray to vivid yellow and red brightly colored designs, some suggestive of lettering. Patches of painted plaster remain adhering to the east wall above the floor level of room B106. Other decoration reported in 1998 included marble revetment still *in situ* on the south jamb of the doorway between this room and B107 to the east.

Along the base of the exterior southwest corner of the *caldaria* was uncovered a double-level raised channel (B264, B344, B346) into which emptied the drains (B349, B348) from the pools above (B338, B107b) (Figs. 16, 17). This channel ran from the east where it abutted the first of the four low walls (B261, B343, B342, B341) projecting from the south side of the bath (B143) as vestiges of furnaces heating the hypocausts below rooms B107 and B136.

A trench laid along the exterior south wall (extending between walls B127 and B66) revealed several deposits, composed at the east end of an upper layer of topsoil (0.70 m deep; B220), a middle one of building rubble (0.60 m deep; B237) from the collapse of the bath, and a lower one of ash (ca. 0.30 m deep; B247). Near the stoke holes (B183, B184) of the two furnaces, above layer B237 was a deposit (B236) of thirty-one sets of recovered animal bones. At the west end of the trench, additional mud-brick layers (B234, B235, B238) between the topsoil (B220) and the rubble layer (B237) may represent an additional phase of activity. The furnaces at the west and east ends of the trench had produced deep deposits of ash that were sampled for flotation.

*The West Service Area (supervised by C. Mango and A. Al-Qasab)*

In 1998 we uncovered archaeologically complicated remains just under the topsoil on the west side of the bath where the service area was situated (Figs. 3, 7). In 1999 we began excavation of two parts of this area: the blocked passage B24 and the space (B323) enclosed by the furnace B139 on the east, a basalt wall on the south (B128) and west (B127, B74), and the massive brick constructions (B23, B25) flank-

<sup>34</sup> Mundell Mango, "Andarin 1998," fig. 14.

<sup>35</sup> See also Mundell Mango on the south section: *tepidarium/caldarium*, "Andarin 1998."

ing the passage B24 on the north. In clearing the north half of this enclosed area down to a floor at ca. 1.50 m below the 1998 level (17.915), we exposed the east face of the furnace and its arched stoke hole (ca. 1.20 m high); the interior of the furnace was left unexcavated. To the north of the furnace we uncovered a narrow staircase (B353) leading up to an elevated tank (B41a) where pipes led through the east wall into room B36, which has a small pool.<sup>36</sup> The surface of the staircase is encrusted by the downward flow of water which then emptied into the passage B24, the second area of excavation in 1999.

Nearly half of the diagnostic pottery sherds (amounting to 65 pieces) found in the bath in 1998 belonged to *saqiya* jars<sup>37</sup> (one 33 cm high found complete; Fig. 19.8<sup>38</sup>) which were secured to a chain or wheel used to lift water from the ground. Heavy lime deposits on pipes<sup>39</sup> and the semicircular pools in the south section (B107b, B338) indicate that groundwater from a well, rather than rainwater from a cistern, supplied the bath. As suggested in our first preliminary report following the 1998 season, both the large curved wall (B73) and the north-south passage (B24) in the west service area resemble in plan fifth/sixth-century water-lifting installations in the bath at Abu Menas near Alexandria, namely a circular area trodden by a pair of oxen operating a *saqiya* and a narrow space housing a lifting wheel, respectively.<sup>40</sup> Exploration of these and a rectangular collapsed area (B94) that may correspond to a well or cistern, should help to confirm these possibilities.

During the 1999 season we began excavation of the blocked narrow passage (B24) that may have provided the housing for a wheel—like that at Abu Menas—to which the *saqiya* jars may have been strapped in order to lift groundwater to elevated tanks. Within the passage we found a curious construction of unmortared

stacked bricks (B334) at ground level at the south end and discovered a clay oven left there from a later period of use at the north end. Between these two features we uncovered a broad north-south arch (B336) in the wall (B25) on the west side of the passage (Fig. 18), under which was sunk a vertical shaft (B337), positioned at an oblique angle to the passage, arch, and bath. On the opposite, east wall (of B23) were encrustations apparently deposited by water lifted by a wheel or chain. The abundant ash that filled the passage and shaft was sampled for flotation. In addition to the marble fluted basin mentioned above (Fig. 12), the shaft yielded a small copper alloy bell which it is tempting to associate with an animal operating a *saqiya* lifting device nearby.

We also started excavation by the main street (B303) which runs between the bath and the *kastron* of Thomas being excavated by Heidelberg, as well as small areas to the southeast (B216, B217, B222) and a series of low walls (B191, B198) and other features (B200) to the north of the bath building which may relate to earlier and later building phases, respectively (Fig. 3).

In sum, during work carried out in 1998 and 1999, three phases of occupation of the bath site have so far been noted: (1–2) that of the bath itself, its construction in ca. 558 and its period of operation probably into the seventh century, at least until the time of the Arab conquest in ca. 640; (3) a phase possibly dating to the Umayyad period (pottery and glass evidence), as seen in the entrance court, where a “kiln” was constructed making use of material from the bath building; and (4) a modern phase, in the twentieth century, when parts of the north hall were reoccupied by a *qubba* complex. The south section of the bath requires further excavation to establish whether it went out of use entirely after the Byzantine period. Further exploration of the south and west areas may bring to light other phases of occupation. There is some evidence of reuse in and outside of passage B24 on the west side of the bath.

Concerning the question posed above about resources spent on technology and architecture, certain preliminary observations may be made. The bath (40 × 23 m) is larger than contemporary rural baths in Syria at Kaper Barada, Sergilla (473), Midjleyya, and

<sup>36</sup> Mundell Mango, “Andarin 1998.”

<sup>37</sup> N. Pollard on pottery and fig. 27.4 in Mundell Mango, “Andarin 1998.”

<sup>38</sup> Four coins of the 6th–7th century were found in the jar excavated in the entrance court; see note 26 above and C. Mango on coins in Mundell Mango, “Andarin 1998.”

<sup>39</sup> Mundell Mango, “Andarin 1998,” fig. 14.

<sup>40</sup> Mundell Mango, “Andarin 1998,” figs. 15–16. See T. Schiøler, *Roman and Islamic Water-lifting Wheels* (Odense, 1973), 131–36; J. P. Oleson, *Greek and Roman Mechanical Water-lifting Devices: The History of a Technology* (Toronto, 1984), 181–82.

Babiska.<sup>41</sup> Furthermore, the range of decorative material (wall mosaics, wall paintings, imported marble revetment) used in the bath indicates that it was, like the *kastron*, considered by its builder Thomas to be a prestigious building. During the coming 2000 season we intend to explore further the evidence for the technology employed in the operation of the bath. The large number of *saqiya* jars excavated exceeds all published finds outside Egypt and is therefore noteworthy.<sup>42</sup>

#### THE POTTERY

The following information was provided by Nigel Pollard. The pottery finds made during the 1999 season of excavation of the Androna bath followed general trends visible in the previous season.<sup>43</sup> Comparisons can be made with material from other sites in northern Syria such as Rusafa, Dehes, and Dibsi Faraj and to a lesser extent sites in southern Syria and Jordan.<sup>44</sup> Recognizable imported finewares (Fig. 19.1–3) were Late Roman C ware (Phocaean Red Slip, Hayes' forms 3 and 10) and African Red Slip (including Hayes' forms 105 and 109), consistently in sixth- to mid-seventh-century forms. Diagnostic sherds of Late Roman C outnumbered those of African Red Slip ware by about three to one.<sup>45</sup> A very high proportion of the excavated pottery came from amphorae and jars. Most is in a calcareous buff fabric, presumed to be local, and much of it has combed decoration (Fig. 19.7). However, most contexts also produced some of Riley's Carthage Late Roman 1

<sup>41</sup> See F. Yegül, *Baths and Bathing in Classical Antiquity* (Cambridge, Mass., 1995), 329–39; G. Charpentier, "Les bains de Sergilla," *Syria* 71 (1994): 113–42. On baths built and/or maintained in the period in general, see M. Mundell Mango, "Building and Architecture," CAH 14, *Late Antiquity: Empire and Successors, A.D. 425–600*, ed. A. Cameron, B. Ward-Perkins, and M. Whitby (Cambridge, 2000), 934–40.

<sup>42</sup> On *saqiya* jars see Schiøler, *Water-lifting Wheels*, 92–109; Oleson, *Water-lifting Devices*, 354–70.

<sup>43</sup> N. Pollard on pottery in Mundell Mango, "Andarin 1998."

<sup>44</sup> M. Mackensen, *Resafa, I. Eine befestigte spätantike Anlage vor den Stadtmauern von Resafa: Ausgrabungen und spätantike Kleinfunde eines Surveys im Umland von Resafa-Sergiopolis* (Mainz, 1984), 50–55; R. P. Harper, "Athis-Neocaesarea-Qasrin-Dibsi Faraj," in J.-Cl. Margueron, ed., *Le moyen Euphrate, zone de contacts et d'échanges* (Leiden, 1980), 335–41; J.-P. Sodini et al., "Déhès (Syrie du nord), campagnes I–III (1976–1978). Recherches sur l'habitat rural," *Syria* 57 (1980): 234–66.

<sup>45</sup> N. Pollard is grateful to John Hayes for examining and commenting on much of this material. Form references are to J. W. Hayes, *Late Roman Pottery* (London, 1972) and *idem*, *A Supplement to Late Roman Pottery* (London, 1980).

(LR1) amphora specimens (now generally considered to be of Syrian/Cilician manufacture<sup>46</sup>), which have now proved to be more common on the site than was suggested in the 1998 report. Less frequently found in 1999 than the LR1 is the "North Syria amphora" material, with red painted decoration on the shoulder (Fig. 19.6). Well represented in the 1999 assemblage are "Brittleware" cookwares and closed forms, of which better examples were excavated of all the major groups recorded in 1998. Neckless and high-necked cookpots and casseroles with a flat rim to take a lid feature among these. All categories of coarseware excavated in 1998 appeared in quantity in 1999, including *saqiya* jars (Fig. 19.8)<sup>47</sup> and small bowls with decorated everted flat rims (Fig. 19.4–5).<sup>48</sup> In general, datable material excavated in both 1998 and 1999 appears to be overwhelmingly of the sixth and seventh centuries, late Byzantine-Umayyad, while very little is likely to be fifth century or earlier, and nothing is clearly Abbasid.

#### WATER SUPPLY SYSTEMS AND AGRICULTURE AT ANDRONA

Reports made in 1998 by Andrew Wilson and Michael Decker assessed the climate, soil, and water conditions of Androna with regard to supply and exploitation of resources. In sum,<sup>49</sup> lacking rivers and streams, Androna relied on ground and rainwater and is consequently dotted with wells and cisterns. Soil conditions are described as a mix of xeric and aridic, gypsorthid, and/or calciothid;<sup>50</sup> in future the soil at Androna will be sampled for specific identification. Although dry farming, of barley for example, was possible there on the margin of the pre-desert with 250–300 mm annual rainfall, other crops such as wheat, olives, or the grapes used to make Androna's recorded wine required field irrigation. This was provided by

<sup>46</sup> J.-Y. Empereur and M. Picon, "Les régions de la production d'amphores impériales en Méditerranée orientale," in *Amphores romaines et histoire économique, dix ans de recherche. Actes du colloque* (Rome, 1989), 236–43.

<sup>47</sup> See note 40 above.

<sup>48</sup> D. Orssaud, "Le passage de la céramique byzantine à la céramique islamique," in P. Canivet and J.-P. Rey-Coquais, eds., *La Syrie de Byzance à l'Islam: VIIe–VIIIe siècles. Actes du Colloque International 1990* (Damascus, 1992).

<sup>49</sup> See A. Wilson on water systems and M. Decker on agriculture in Mundell Mango, "Andarin 1998."

<sup>50</sup> See the bibliography cited by M. Decker in "Andarin 1998."

extramural reservoirs ( $61 \times 61$  m; Figs. 2, 20, 21) fed by a system of *foggaras* or *qanats*, subterranean inclined galleries that tap aquifers, leading water to the surface.<sup>51</sup> Vertical shafts give access to the galleries. The *foggaras* supplying Androna's reservoirs originated at some distance from the site.<sup>52</sup>

Work on the water supply and agriculture at Androna, started in 1998 by Andrew Wilson and Michael Decker, was continued in 1999. A sounding carried out in 1999 at one edge of the southeast extramural reservoir, planned by Butler,<sup>53</sup> confirmed the results obtained the previous year by drilling at its center, thus establishing the relatively shallow depth (3.3 m) and providing the water-holding capacity (Fig. 20). The traces of this reservoir's *foggara* at ground level have been plowed out. Northeast of the reservoir, slag and related material from industrial activity were observed (see below). Similar survey and sounding were carried out at the northwest reservoir (depth ca. 2.5 m),<sup>54</sup> where a discharge system was observed on the side opposite the entry channel from the *foggara* (Fig. 21); industrial waste was likewise observed to the east of the reservoir. Pottery recovered during the soundings is being studied by Nigel Pollard. At the end of the 1999 season, a brief exploratory assessment was made of the extent of the *foggara* systems feeding both reservoirs, with a view to applying to the Department of Antiquities in Damascus for an extramural survey permit. Likewise an attempt was made to verify verbal reports of the location of other large reservoirs said to have served the site. Similar *foggara* and reservoir systems in the basalt region were recorded by Mouterde and Poidebard.<sup>55</sup> The two reservoirs studied at Androna appear contemporary. As stated above,

Butler dated the southeast reservoir to the second century on the basis of its architectural moldings. However, other factors must be considered, and the reservoirs and *foggaras* cannot yet be precisely dated.

Our agriculture specialist Michael Decker began recovery of palaeobotanical material in excavated areas, which, after flotation, will be studied by Mark Robinson in Oxford. In addition to the production of wine at Androna attested by a written source and well within required soil and temperature conditions, archaeological evidence of oil processing has also been encountered. The basins of olive mills (of *mola olearia* type<sup>56</sup>) observed at and near Androna—far east of what is considered the zone of olive cultivation—suggest industrial-scale production of oil; one mill was found by the north wall, lying with column shafts possibly reused as rollers. The upper parts (*catilli*) of flour mills excavated in the bath are being studied. Animal bones collected in 1998 and 1999 will be studied in relation to the exploitation of livestock at Androna where pastoralism probably played a large part in the economy.

#### INDUSTRY AT ANDRONA

Chris Salter of the Department of Materials, Oxford University, reported in 1998<sup>57</sup> on pyro-ceramic material collected at two locations in Androna. One sample, a small slag cake (smithing hearth bottom, SHB), found in the bath (room B136), suggested ironworking. The samples taken from north of the southeast reservoir (see above) included pieces from a hearth-lining and slaglike material. The high temperatures required to vitrify or melt the hearth surface observed, suggest metal or glass-working at the site. Further slag was collected at Androna in 1999 and is also being studied at Oxford.

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<sup>51</sup> For bibliography see Wilson in "Andarin 1998," which cites, among others, D. R. Lightfoot, "Syrian Qanat Romani: History, Ecology, Abandonment," *Journal of Arid Environments* 33 (1996): 321–36.

<sup>52</sup> Mouterde and Poidebard, *Le limes*, 174.

<sup>53</sup> Architecture, II, B, 63, ill. 63.

<sup>54</sup> Mentioned by A. Zakariyya, *Jawla athariyya [Archaeological tour]* (Damascus, 1934). We should like to thank Prof. Irfan Shahid for drawing our attention to this publication and Dr. Robert Hoyland for translating the relevant passages.

<sup>55</sup> Mouterde and Poidebard, *Le limes*, 108, 110–13, 117–25, 149–50. See now also B. Geyer and M.-O. Rousset, "Les steppes arides de la Syrie du Nord à l'époque byzantine ou la rouée vers l'est" in B. Geyer, ed., *Conquête de la Steppe* (Lyons, 2001), 111–21.

<sup>56</sup> On which see R. Frankel, S. Avitsur, and E. Ayalon, *History and Technology of Olive Oil in the Holy Land* (Sheffield, 1994), 31–32.

<sup>57</sup> In Mundell Mango, "Andarin 1998."